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(54) Unitary resilient suspension device

(57) A unitary resilient suspension device comprises one or more pairs of support members (11 and 12; 13 and 14) and between each pair of support members there is provided a spring member (20, 21 and 22) integrally formed therewith. Each spring member is defined by a pair of convolute side portions (30A and 30B; 31A and 32B; 32A and 32B) and a substantially planar end portion (40, 41 and 42). The convolute side portions lie in a plane substantially perpendicular to that of the support members and the end portions lie in a plane substantially parallel to that of the support members.

The device may suitably be made of a plastics material, e.g. polystyrene pvc or an acrylic material and is conveniently formed by extrusion.

Two or more such suspension devices can be used, in conjunction with layers of a cushioning material, to form an upholstery article such as a mattress.

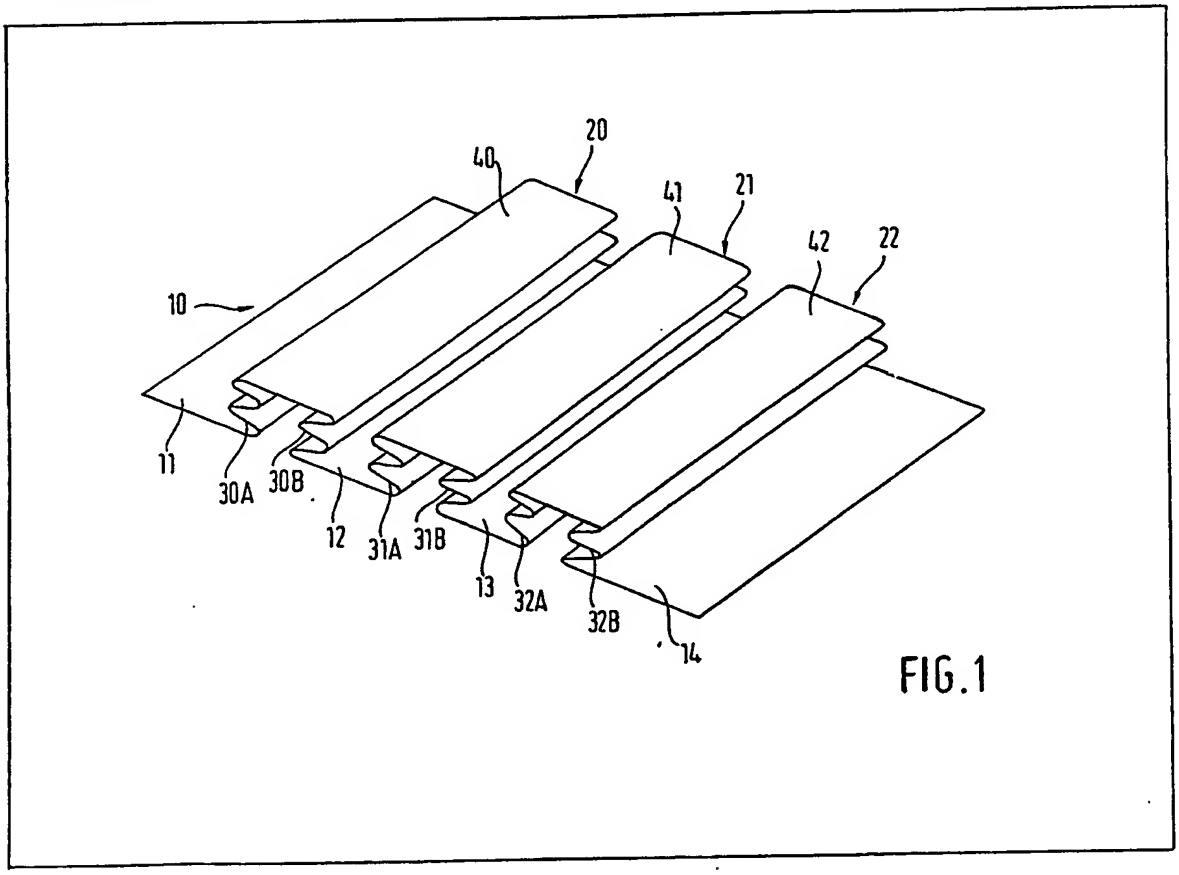

FIG.1

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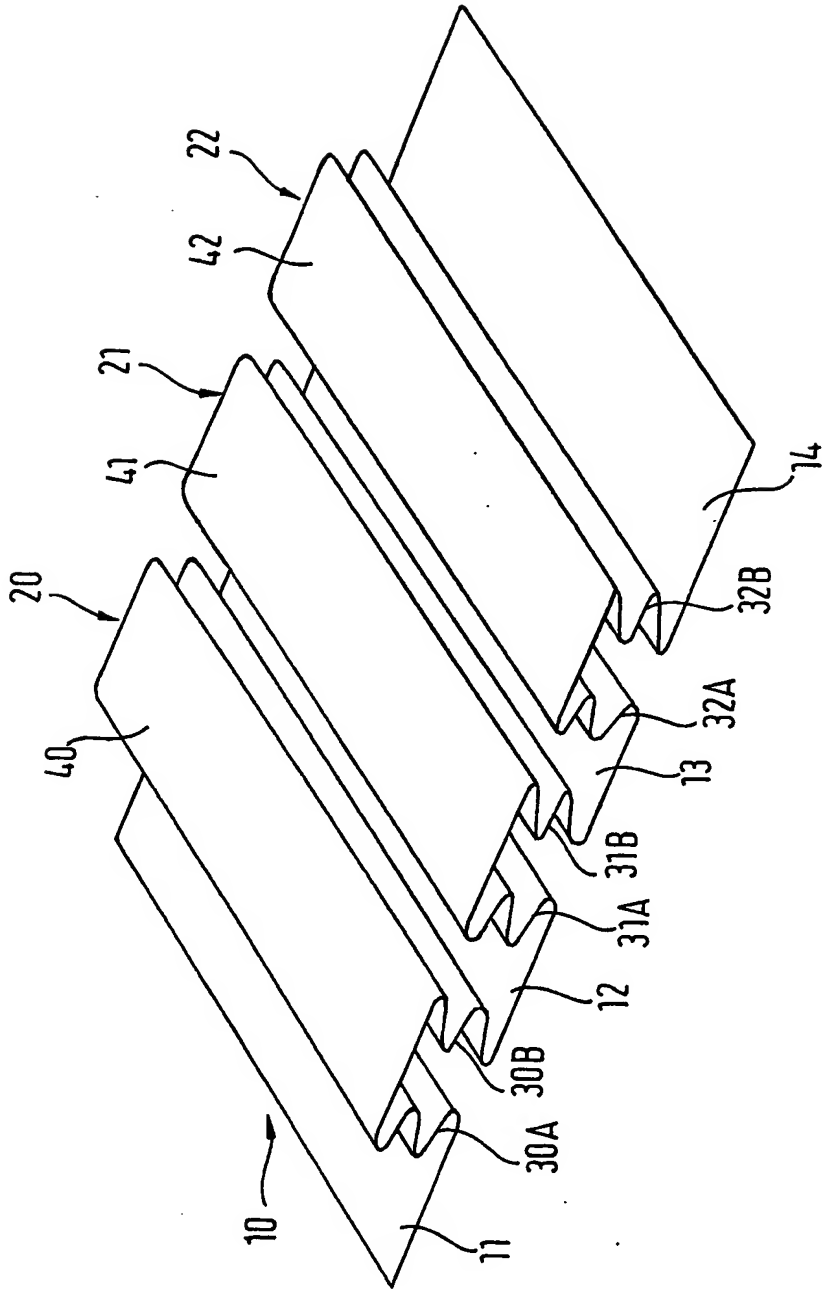

FIG.1

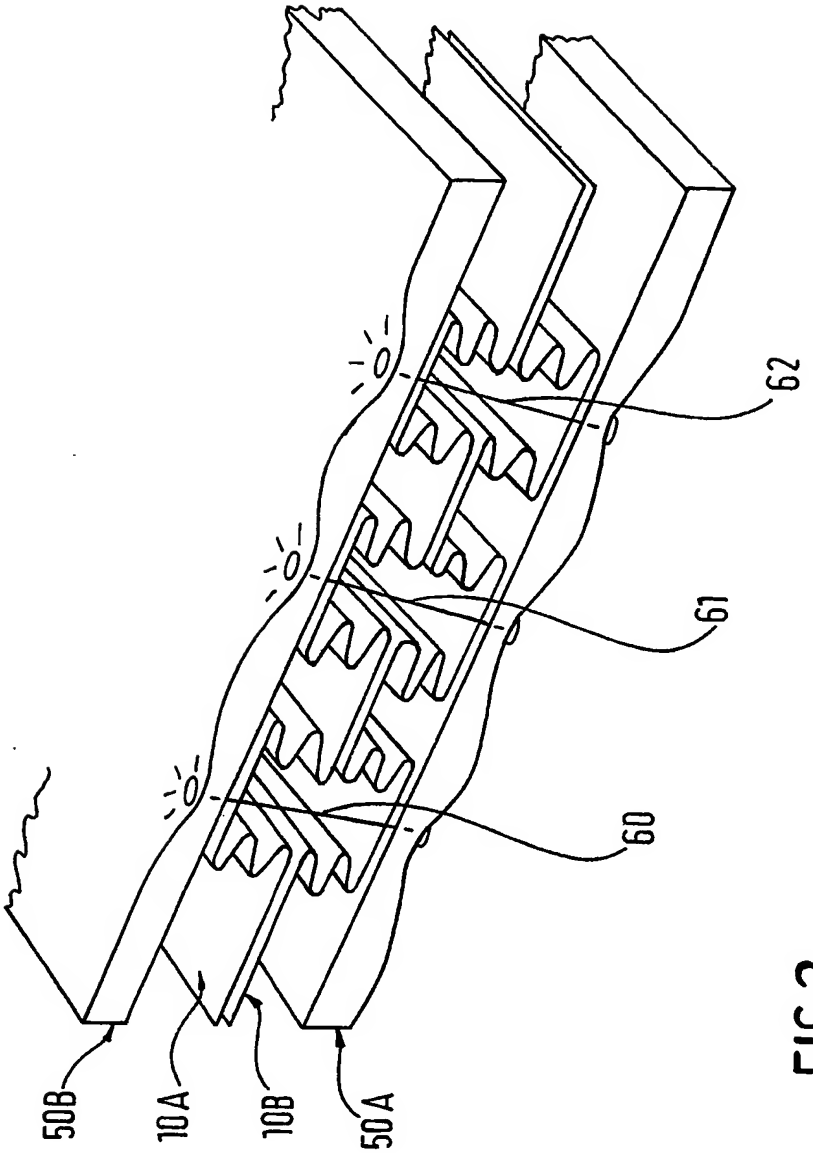

FIG.2

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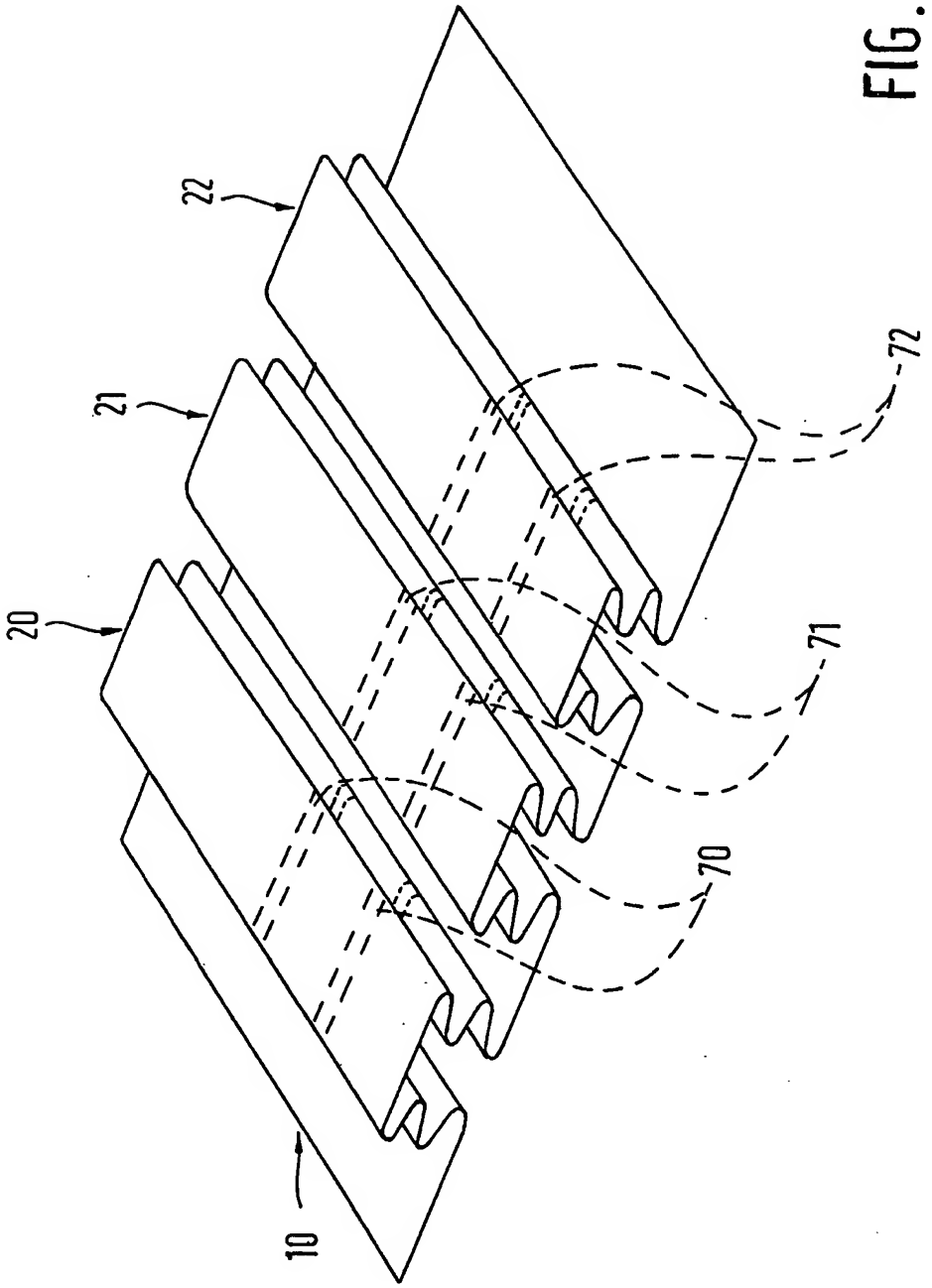
FIG. 3



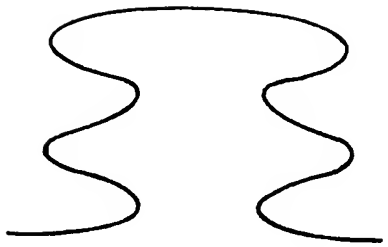


FIG. 4A

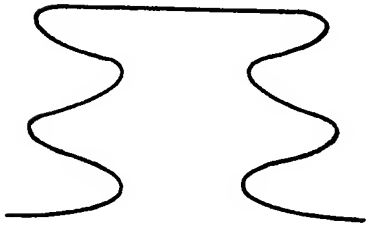


FIG. 4B

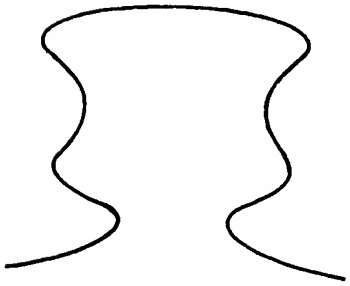


FIG. 4C

SPECIFICATION

Unitary resilient suspension device

This invention relates to a unitary resilient suspension device and to upholstery articles containing one or more such devices.

Hitherto, spring systems for upholstery articles have been made exclusively of metal and have been of one of the following types:

(a) Single- or double-tapered helical springs, adjacent springs being joined permanently together at top and bottom;

(b) Pocketed springs, i.e. individual helical springs, each enclosed in a pocket of fabric or foam, adjacent pockets being loosely joined together.

Whilst such spring systems have hitherto proved satisfactory in use, a great deal of labour-intensive assembly work is required before the spring system can be used in the production of upholstery articles.

We have now found that a unitary resilient suspension device, made of a plastics material and comprising one or more pairs of support members and one or more convoluted spring members, provides a degree of deflection which, when the device is incorporated in an upholstery article, is at least as acceptable as that achieved by the use of conventional metal spring systems.

According to a first aspect of the present invention, there is provided a unitary resilient suspension device made of a plastics material, the device comprising one or more pairs of support members, the or each pair of support members having a spring member integrally formed therewith, each said spring member being defined by a pair of convolute side portions and a substantially planar end portion, the convolute side portions lying in a plane substantially perpendicular to that of the support members and the end portion lying in a plane substantially parallel to that of the support members.

According to a second aspect of the present invention, there is provided an upholstery article containing one or more unitary resilient suspension devices, each said suspension device being as described in the immediately-preceding paragraph.

Unitary resilient suspension devices according to the present invention may suitably be made from polystyrene, pvc or acrylic materials. Such materials may conveniently be formed into unitary suspension devices by extrusion.

Preferably, the extruded material may be of a width which corresponds to the standard length of a matress (i.e. about 200 cm) so as to facilitate the production of suspension devices for mattresses of different widths.

One or more suspension devices can be used, in conjunction with cushioning materials such as foams, sheets or batts, to provide a resilient interior for mattresses, cushions and the like.

In a preferred embodiment of the present invention, one or more slots (especially slots of substantially V-shaped transverse cross-section) may be provided across the shorter dimensions of the planar end portion and/or the shorter dimensions of the convolute side portions. The provision of such V-shaped slots enables the suspension devices of the present invention to function in a manner similar to the individual springs of conventional upholstery spring assemblies.

The present invention will be illustrated, merely by way of example, in the following description and with reference to the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of a suspension device according to the first aspect of the present invention;

Figure 2 is a perspective view (with parts cut away) of an upholstery article containing two of the devices illustrated in Figure 1;

Figure 3 is a further perspective view of a suspension device according to the first aspect of the present invention, showing the V-shaped slots referrred to hereinabove; and

Figures 4A to 4C are schematic cross-sectional views of a suspension device, showing various configurations which may be utilised in making suspension devices according to the present invention.

Referring now to Figure 1, a suspension device according to the present invention is shown generally at 10. It comprises two pairs of support members 11, 12, 13 and 14, and between each adjacent pair of support members there is provided a spring member (shown generally at 20, 21 and 22). Each spring member is defined by a pair of convolute side portions 30A, 30B; 31A, 31B; and 32A, 32B and a substantially planar end portion 40, 41 and 42 respectively.

Referring to Figure 2, two suspension devices (shown generally at 10A and 10B) are used in conjunction with cushioning material layers 50A and 50B to form an upholstery article. The layers 50A and 50B are secured to each other so as to enclose the device 10A and 10B by means of the conventional upholstery-buttoning technique, shown schematically at 60, 61 and 62.

In the embodiment shown in Figure 3, a plurality of substantially V-shaped slots (shown schematically at 70, 71 and 72) is provided across the shorter dimension of the spring members 20, 21 and 22 respectively.

Figures 4A, 4B and 4C show various configurations which are available for suspension devices according to the present invention:

Figure 4A — uniform size of convolutions; uniform amplitude.

Figure 4B — non-uniform convolutions; uniform amplitude.

Figure 4C — non-uniform convolutions; non-uniform amplitude.

CLAIMS

1. A unitary resilient suspension device, made of a plastics material, the device comprising one or more pairs of support members, the or each pair of support members having a spring member

integrally formed therewith, each said spring member being defined by a pair of convolute side portions and a substantially planar end portion, the convolute side portions lying in a plane substantially perpendicular to that of the support members and the end portion lying in a plane substantially parallel to that of the support members.

2. A device according to Claim 1, in which the plastics material if polystyrene, polyvinyl chloride or an acrylic material.

3. A device according to Claim 1 or 2, in which the plastics material is formed by extrusion.

4. A device according to Claim 3, in which the extruded material is of a width corresponding to the standard length of a mattress.

5. A device according to any one of Claims 1 to 4, in which one or more slots are provided, each slot extending across the shorter dimension of the planar end portion and/or the shorter dimensions of the convolute side portions.

6. A device according to Claim 5, in which each slot is of substantially V-shaped transverse cross-section.

7. A unitary resilient suspension device, substantially as hereinbefore described, with reference to and as illustrated in Figures 1 and 4 of the accompanying drawings.

8. A unitary resilient suspension device, substantially as hereinbefore described, with reference to and as illustrated in Figure 3 of the accompanying drawings.

9. An upholstery article containing one or more unitary resilient suspension devices according to any one of the preceding claims.

10. An upholstery article, substantially as hereinbefore described, with reference to and as illustrated in Figure 2 of the accompanying drawings.

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